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| 10/019,961 | 01/04/2002 | Francois Capman | MTR.0031US | 6260 |

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| WOZNIAK, JAMES S |

| ART UNIT | PAPER NUMBER |
|---|---|
| 2655 | |

DATE MAILED: 02/16/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

| | Application No. | Applicant(s) |
|---|---|---|
| **Office Action Summary** | 10/019,961 | CAPMAN ET AL. |
| | Examiner | Art Unit | |
| | James S. Wozniak | 2655 | |

*-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --*

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE <u>3</u> MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

1)☒ Responsive to communication(s) filed on <u>04 January 2002</u>.

2a)☐ This action is **FINAL**.    2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

4)☒ Claim(s) <u>1-28</u> is/are pending in the application.

    4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) <u>1-12,14,15,17,18,20-24 and 26-28</u> is/are rejected.

7)☒ Claim(s) <u>13,16,19 and 25</u> is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

**Application Papers**

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on <u>04 January 2002</u> is/are: a)☒ accepted or b)☐ objected to by the Examiner.

    Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

    Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

    a)☒ All   b)☐ Some * c)☐ None of:

        1.☒ Certified copies of the priority documents have been received.

        2.☐ Certified copies of the priority documents have been received in Application No. _____.

        3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

    * See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

1) ☒ Notice of References Cited (PTO-892)

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
    Paper No(s)/Mail Date _____.

4) ☐ Interview Summary (PTO-413)
    Paper No(s)/Mail Date. _____.

5) ☐ Notice of Informal Patent Application (PTO-152)

6) ☐ Other: _____.

## DETAILED ACTION

### *Claim Rejections - 35 USC § 112*

1.      The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the
> subject matter which the applicant regards as his invention.

2.      **Claims 1-10** are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for

failing to particularly point out and distinctly claim the subject matter which applicant regards as

the invention.

Regarding **claims 1-10**, the phrase "or similar type" renders the claim(s) indefinite

because the claim(s) include(s) elements not actually disclosed (those encompassed by "or

similar type"), thereby rendering the scope of the claim(s) unascertainable.  See MPEP

§ 2173.05(d).

### *Claim Rejections - 35 USC § 103*

3.      The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all

obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in
> section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are
> such that the subject matter as a whole would have been obvious at the time the invention was made to a person
> having ordinary skill in the art to which said subject matter pertains.  Patentability shall not be negatived by the
> manner in which the invention was made.

4.      **Claims 1, 3-4, 6, and 8-9** are rejected under 35 U.S.C. 103(a) as being unpatentable over

Jain *(U.S. Patent: 5,189,701)* in view of Taori et al *(U.S. Patent: 6,292,774)*.

With respect to **Claims 1 and 6**, Jain discloses:

Weighting the samples of each frame by an analysis window of Hamming, Hanning,

Kaiser or similar type (Hamming window, Col. 8, Lines 44-58);

Calculating a spectrum of the audio signal by transforming each frame of weighted samples in

the frequency domain (Fourier transform, Col. 8, Lines 59-63; Fig. 11);

Processing the spectrum of the audio signal to deliver synthesis parameters for a signal

derived from the analyzed audio signal (determining amplitude and phase related spectrum data,

Col. 8, Line 59- Col. 9, Line 21);

Wherein the successive frames comprise frame pairs that exhibit mutual overlaps of less

than N/2 samples (processing frame pairs, Col. 5, Lines 50-61; overlapping less than a half

frame, Col. 8, Lines 44-58; Fig. 6).

Jain does not teach that frame pairs comprise an alternation of complete and incomplete

frames, however Taori discloses such a frame alternation format (Col. 8, Line 41- Col. 9, Line

16; Col. 2, Lines 26-44).

Jain and Taori are analogous art because they are from a similar field of endeavor in

speech parameter coding. Thus, it would have been obvious to one of ordinary skill in the art, at

the time of invention, to modify the teachings of Jain with the frame alternation encoding format

taught by Taori in order to provide a means for reducing the bit rate required for transmitting a

speech signal (Taori, Col. 2, Lines 14-15).

With respect to **Claims 3 and 8**, Taori additionally recites:

The incomplete sets of synthesis parameters include data representing a filter for

interpolating at least one of the synthesis parameters (synthesis filter parameters in an incomplete

frame used for interpolation, Col. 3, Lines 23-35; Col. 4, Lines 39-49).

With respect to **Claims 4 and 9**, Jain further discloses:

The processing of the spectrum of the audio signal comprises extracting coding parameters for

transmitting and/or storing a coded audio signal (transmitting encoded speech parameters, Col. 1,

Lines 5-8; Col. 7, Line 60- Col. 8, Line 13).


5.      **Claims 2 and 7** are rejected under 35 U.S.C. 103(a) as being unpatentable over Jain *(U.S.*

*Patent: 5,189,701)* in view of Taori et al *(U.S. Patent: 6,292,774)*, and further in view of Chen

*(U.S. Patent: 5,710,863)*.

With respect to **Claims 2 and 7**, Jain in view of Taori teaches the audio coding system

utilizing Hamming window processing, spectrum analysis, and a frame alternation format, as

applied to claims 1 and 6. Taori also teaches incomplete frame processing utilizing interpolation

(Col. 8, Line 41- Col. 9, Line 16). Jain in view of Taori does not specifically suggest teach the

use of data representing an error of interpolation in the incomplete frames, however Chen

teaches including an interpolation error in a coded speech signal requiring interpolation

processing (Col. 8, Lines 51-62).

Jain, Taori, and Chen are analogous art because they are from a similar field of endeavor

in speech parameter coding. Thus, it would have been obvious to one of ordinary skill in the art,

at the time of invention, to modify the teachings of Jain in view of Taori with the use of an

interpolation error as taught by Chen in order to provide a means for determining any error that

would affect the output of smoothly reproduced speech (Chen, Col. 6, Lines 37-39).


6.      **Claims 5 and 10** are rejected under 35 U.S.C. 103(a) as being unpatentable over Jain

*(U.S. Patent: 5,189,701)* in view of Taori et al *(U.S. Patent: 6,292,774)*, and further in view of

Handel *(U.S. Patent: 5,943,429)*.

With respect to **Claims 5 and 10**, Jain in view of Taori teaches the audio coding system

utilizing Hamming window processing, spectrum analysis, and a frame alternation format, as

applied to claims 1 and 6. Jain in view of Taori does not teach the use of a spectral subtraction in

spectrum processing, however Handel teaches such spectrum processing (Col. 3, Line 58- Col.

4, Line 6).

Jain, Taori, and Handel are analogous art because they are from a similar field of

endeavor in speech parameter coding. Thus, it would have been obvious to one of ordinary skill

in the art, at the time of invention, to modify the teachings of Jain in view of Taori with the

spectral subtraction means taught by Handel in order to provide better noise reduction without

sacrificing audio quality (Handel, Col. 1, Lines 60-62).


7.      **Claims 11-12 and 14-15** are rejected under 35 U.S.C. 103(a) as being unpatentable over

Jain *(U.S. Patent: 5,189,701)* in view of Fielder et al *(U.S. Patent: 5,109,417)*.

With respect to **Claims 11 and 14**, Jain recites:

Obtaining successive spectral estimates respectively corresponding to frames of N

samples of the audio signal weighted by an analysis window N being an integer greater than 1

(Hamming window, Col. 8, Line 44- Col. 9, Line 21);

Evaluating each frame of the audio signal by transforming the spectral estimates in the

time domain (inverse Fourier transform, Col. 13, Lines 62-68);

Modifying teach evaluated frame by applying thereto a processing corresponding to a

division by the analysis window and to a multiplication by a synthesis window (Hamming

window compensation and synthesis window multiplication, Col. 15, Lines 11-36); and

Synthesizing the audio signal as an overlap sum of the modified frames (Col. 15, Lines

33-36; and smoothing, Fig. 2, Element 146).

Wherein the successive frame exhibit mutual overlaps of L samples, L being an integer

greater than 1 and smaller than N/2 (processing frame pairs, Col. 5, Lines 50-61; overlapping

less than a half frame, Col. 8, Lines 44-58; Fig. 6);

Jain does not teach the synthesis window satisfying condition calculation for overlapped

speech frames as recited in claims 11 and 14, however Fielder teaches such a calculation (Col.

33, Line 59- Col. 34, Line 62).

Jain and Fielder are analogous art because they are from a similar field of endeavor in

speech parameter coding. Thus, it would have been obvious to one of ordinary skill in the art, at

the time of invention, to modify the teachings of Jain with the synthesis window satisfying

condition calculation taught by Fielder in order to implement a requirement that will ensure that

time domain windowing effects are canceled (Fielder, Col. 33, Lines 58-65).

With respect to **Claims 12 and 15**, Fielder further discloses a synthesis window based

upon a sample number (n), which would inherently increase with a greater sample number (Col.

33, Line 59- Col. 34, Line 62).

8.      **Claims 17-18, 21, 23-24, and 27** are rejected under 35 U.S.C. 103(a) as being

unpatentable over Taori et al *(U.S. Patent: 6,292,774)* in view of Princen et al *("Analysis/Filter*

*Bank Design Based on Time Domain Aliasing Cancellation, 1986)*.

With respect to **Claims 17 and 23**, Taori discloses:

Defining a set of successive frames of N samples of the audio signal, N being an integer

greater than 1 (encoding speech frames, Col. 3, Lines 55-65);

Obtaining spectral estimates for a subset of the frames by processing synthesis

parameters respectively associated with the frames of said subset (speech parameters for

complete frames, Col. 3, Line 40- Col. 4, Line 33);

Obtaining spectral estimates for the frames of the set that are not in said subset with an

interpolation of at least part of the synthesis parameters (incomplete frame interpolation, Col. 4,

Lines 39-49);

Synthesizing the audio signal *(Col. 3, Lines 40-51)*;

Taori does not specifically suggest a frame overlapping operation or the synthesis

window satisfying condition calculation as recited in claims 17 and 23, however Princen teaches

such a synthesis window satisfying condition (Pages 1158-1159, Section IV, Equation 25a; Fig.

5).

Taori and Princen are analogous art because they are from a similar field of endeavor in

speech parameter coding. Thus, it would have been obvious to one of ordinary skill in the art, at

the time of invention, to modify the teachings of Taori with the synthesis window satisfying

condition calculation taught by Princen in order to implement a requirement that will ensure that

frequency domain representations between adjacent time segments are canceled (Princen, Page 1158).

With respect to **Claims 18 and 24**, Princen further teaches a window length that increases between min and max overlaps (Page 1157).

With respect to **Claims 21 and 27**, Taori further recites:

Associating data representing an interpolator filter with the frame that are not in the subset (interpolator LPCs, Col. 12, Lines 38-42);

Interpolating at least one of the synthesis parameters by means of the interpolator filter represented by the data (Col. 12, Lines 64-67; Fig. 8).

9.       **Claims 20 and 26** are rejected under 35 U.S.C. 103(a) as being unpatentable over Taori et al *(U.S. Patent: 6,292,774)* in view of Princen et al *("Analysis/Filter Bank Design Based on Time Domain Aliasing Cancellation, 1986)* and further in view of Chen *(U.S. Patent: 5,710,863)*.

With respect to **Claims 20 and 26**, Taori in view of Princen teaches the audio coding system utilizing Hamming window processing, spectrum analysis, and a frame alternation format, as applied to claims 17 and 23. Taori also teaches incomplete frame processing utilizing interpolation (Col. 8, Line 41- Col. 9, Line 16). Taori in view of Princen does not specifically suggest teach the use of data representing an error of interpolation in the incomplete frames, however Chen teaches including an interpolation error in a coded speech signal requiring interpolation processing for use during error correction at synthesis (Col. 8, Lines 51-62; Col. 13, Line 62- Col. 14, Line 7).

Taori, Princen, and Chen are analogous art because they are from a similar field of

endeavor in speech parameter coding. Thus, it would have been obvious to one of ordinary skill

in the art, at the time of invention, to modify the teachings of Taori in view of Princen with the

use of an interpolation error as taught by Chen in order to provide a means for determining any

error that would affect the output of smoothly reproduced speech (Chen, Col. 6, Lines 37-39).


10.     **Claims 22 and 28** are rejected under 35 U.S.C. 103(a) as being unpatentable over Taori

et al *(U.S. Patent:  6,292,774)* in view of Princen et al *("Analysis/Filter Bank Design Based on*

*Time Domain Aliasing Cancellation, 1986)* and further in view of Jain *(U.S. Patent:  5,189,701)*.

With respect to **Claims 20 and 26**, Taori in view of Princen teaches the audio coding

system utilizing Hamming window processing, spectrum analysis, and a frame alternation

format, as applied to claims 17 and 23. Taori also teaches incomplete frame processing utilizing

interpolation  (Col. 8, Line 41- Col. 9, Line 16), but does not teach the use of cepstral

parameters. Jain, however, teaches the use of cepstral parameters in speech coding (Col. 6, Lines

16-28).

Taori, Princen, and Jain are analogous art because they are from a similar field of

endeavor in speech parameter coding. Thus, it would have been obvious to one of ordinary skill

in the art, at the time of invention, to modify the teachings of Taori in view of Princen with the

use of cepstral parameters as taught by Jain in order to provide a means for calculating a speech

signal that can be reproduced at a decoder without distortion (Jain, Col. 2, Lines 5-16).

*Allowable Subject Matter*

11.    Claims 13 and 16 are objected to as being dependent upon a rejected base claim, but

would be allowable if rewritten in independent form including all of the limitations of the base

claim and any intervening claims.

12.    The following is a statement of reasons for the indication of allowable subject matter:

With respect to **Claims 13 and 16**, the prior art of record fails to explicitly teach or fairly

suggest a method and system for decoding an encoded speech signal by inverse fast Fourier

transforming the speech signal to obtain spectral parameters in a time domain and multiplying

the obtained speech parameters by a synthesis window verified according to the equation recited

in claims 11 and 14, wherein the synthesis window for $0<i<L$ (wherein i is the sample rank) is a

raised half sinusoid satisfying the equation noted on page 31 of the specification (Equation 21)

and increases from 0 to a constant, A, for i ranging from 0 to L.

With respect to **Claims 19 and 25**, the prior art of record fails to explicitly teach or fairly

suggest a method and system for decoding an encoded speech signal by inverse fast Fourier

transforming the speech signal to obtain spectral parameters in a time domain and multiplying

the obtained speech parameters by a synthesis window verified according to the equation recited

in claims 17 and 23, wherein the synthesis window for $N/2-M/p<i<N/2+M/p$ (wherein i is the

sample rank) is a raised half sinusoid satisfying the equation noted on page 38 of the

specification and increases for i ranging from $N/2-M/p$ to $N/2$.

*Conclusion*

13.     The prior art made of record and not relied upon is considered pertinent to applicant's

disclosure:

        Manley et al *(U.S. Patent: 3,681,530)*- teaches a frame alternation coding scheme.

        Das et al *(U.S. Patent: 6,260,017)*- teaches the use of interpolation to recover speech

samples not included in a subset frame.


14.     Any inquiry concerning this communication or earlier communications from the

examiner should be directed to James S. Wozniak whose telephone number is (571) 272-7632.

The examiner can normally be reached on M-Th, 7:30-5:00, F, 7:30-4, Off Alternate Fridays.

        If attempts to reach the examiner by telephone are unsuccessful, the examiner's

supervisor, David Hudspeth can be reached at (571) 272-7843. The fax phone number for the

organization where this application or proceeding is assigned is 571-273-8300.

        Information regarding the status of an application may be obtained from the Patent

Application Information Retrieval (PAIR) system. Status information for published applications

may be obtained from either Private PAIR or Public PAIR. Status information for unpublished

applications is available through Private PAIR only. For more information about the PAIR

system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR

system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).


James S. Wozniak
2/7/2006

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